
Suisun Marsh Monitoring Program Channel Water Salinity Report

Reporting Period: January 2004

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1. SUISUN MARSH MONITORING STATIONS AND REPORTING REQUIREMENT

As per SWRCB Water Rights Decision 1641, dated December 29, 1999, and previous SWRCB decisions, the California Department of Water Resources (DWR) is required to provide monthly channel water salinity compliance reports for the Suisun Marsh to the SWRCB. The monthly reports summarizing channel water salinity conditions are submitted for October through May of the following calendar year in accordance with SWRCB requirements. Conditions of channel water salinity in the Suisun Marsh are determined by specific electrical conductivity and specific electrical conductivity is referred to in the reports as "specific conductance". The locations of all listed stations are shown in Figure 5.

This report is required to include salinity data from the stations listed below:

Station Identification	Station Name	General Location	Classification
C-2*	Collinsville	Western Delta	Compliance Station
S-64	National Steel	Eastern Suisun Marsh	Compliance Station
S-49	Beldon's Landing	Northern Suisun Marsh	Compliance Station
S-42	Volanti	North-Western Suisun Marsh	Compliance Station
S-21	Sunrise	North-Western Suisun Marsh	Compliance Station

In addition, data from the stations listed below are included in the monthly reports to provide information on salinity conditions in the western Suisun Marsh.

Station Identification	Station Name	General Location	Classification
S-97	Ibis	Western Suisun Marsh	Monitoring Station
S-35	Morrow Island	South-Western Suisun Marsh	Monitoring Station

Information on Delta outflow, area rainfall, and operation of the Suisun Marsh Salinity Control Gates are also included in the monthly reports to provide information on conditions that may affect channel water salinity in the Marsh.

* Throughout the report, the representative data from nearby USBR station is used in lieu of data from station C-2.

2. Monitoring Results

2.1 Channel Water Salinity Compliance

During the month of January, 2004, salinity conditions at all five compliance stations are in compliance with channel water salinity standards of SWRCB (Table 1). Compliance with standards for the month of January was determined for each compliance station by comparing the progressive daily mean of high-tide specific conductance (SC) with respective standards. The standard for the eastern and western compliance stations was 12.5 mS/cm during January 2004. Table 1 lists monthly mean high-tide SC at these compliance stations. The progressive daily mean (PDM) is the monthly average of both daily high-tide SC values. The mathematical equation is as shown below.

$$\text{PDM} = \frac{\sum \text{daily average of high tide SC}}{\# \text{ days of the month}}$$

2.2 Delta Outflow

High outflow in the first half of January was a result of significant precipitation resulting in high runoff. The January Delta outflow varied from 10,000 cfs to 67,000 cfs as shown in Figure 3. January outflow started off high, around 45,000 cfs and peaked to about 67,000 cfs on January 3, 2004. The monthly Delta outflow is represented by the mean Net Delta Outflow Index (NDOI). Thereafter, NDOI declined and became stable around 36,000 cfs for a few days. On January 13, 2004, NDOI increased by an insignificant amount for a short duration followed by an abrupt decline and continued to decline for the rest of January. The NDOI is the estimated daily average of Delta outflow. Mean NDOI for January is listed below:

Month	Mean NDOI (cubic feet per second)
January	30,983

2.3 Rainfall

Total monthly rainfall at the Waterman Gauging Station in Fairfield during January 2004 is listed below:

Month	Total Rainfall (inches)
January	2.84

2.4 Suisun Marsh Salinity Control Gate (SMSCG) Operations

Operations and flashboard/boat lock configuration at the SMSCG during January 2004 is summarized below.

Date	Gate status	Flashboards status	Boat Lock status
January 1 - 31	3 gates open	Installed	Closed

The salinity control gates continued to remain open during January because of low salinity levels throughout the marsh. This is expected to be the case in the coming months unless water quality condition changes and warrants re-operation of the gates.

3. Discussion

3.1 Factors Affecting Channel Water Salinity in the Suisun Marsh

Factors that affect channel water salinity levels in the Suisun Marsh include:

- delta outflow;
- tidal exchange;
- rainfall and local creek inflow;
- managed wetland operations; and,
- operation of the SMSCG and flashboard configurations.

3.2 Observations and Trends

3.2.1 Conditions during the Reporting Period

During January 2004, salinity levels continued to be very low. Good water quality conditions in December lead to low salinity levels at the start of January. The high outflows in early January dissipated the already low salinity level further throughout the marsh. Salinity levels at all compliance stations varied between 0.0 mS/cm and 4.5 mS/cm as shown in Figure 1. At the two monitoring stations (S-97 and S-35) salinity levels ranged from 3.0 mS/cm and 6.5 mS/cm as shown in Figure 2. Salinity levels at compliance and monitoring sites were below 5.0 mS/cm and 7.0 mS/cm, respectively, throughout January.

Channel water salinity conditions in the marsh appeared to be influenced by high outflows in January 2004 and favorable antecedent conditions of December 2003.

3.2.2 Comparison of Reporting Period Conditions with Previous Years

Monthly mean high-tide SC at the compliance and monitoring stations for January 2004 were compared with means for those months during the previous nine years (Figure 4).

Means salinity pattern of all compliance and monitoring stations were similar to that of January 2004, but with higher magnitude and S35 being higher than S97 for the month. Comparing to the previous nine years, the following observations are made for each of the stations salinity levels:

- C-2 salinity level for January 2004 was similar to that of 2003 and sixth highest
- S64 salinity level for January 2004 was similar to that of 2002 and sixth highest
- S49 was the sixth highest
- S42 was at the same level as that of 1999, and was seventh highest
- S21 was at the same level as that of 1996, and was fourth highest
- S97 was at the same level as 1998, and was fourth lowest
- S35 salinity pattern was similar to that of 1995, 1996, 1998, 1999, 2000, and 2001; it was the fifth highest

Overall, January 2004 salinity levels were ranked sixth in past 9 years in terms of high Specific Conductance.

Table 1**Monthly Mean High Tide Specific Conductance at Suisun Marsh
Water Quality Compliance Stations****January 2004**

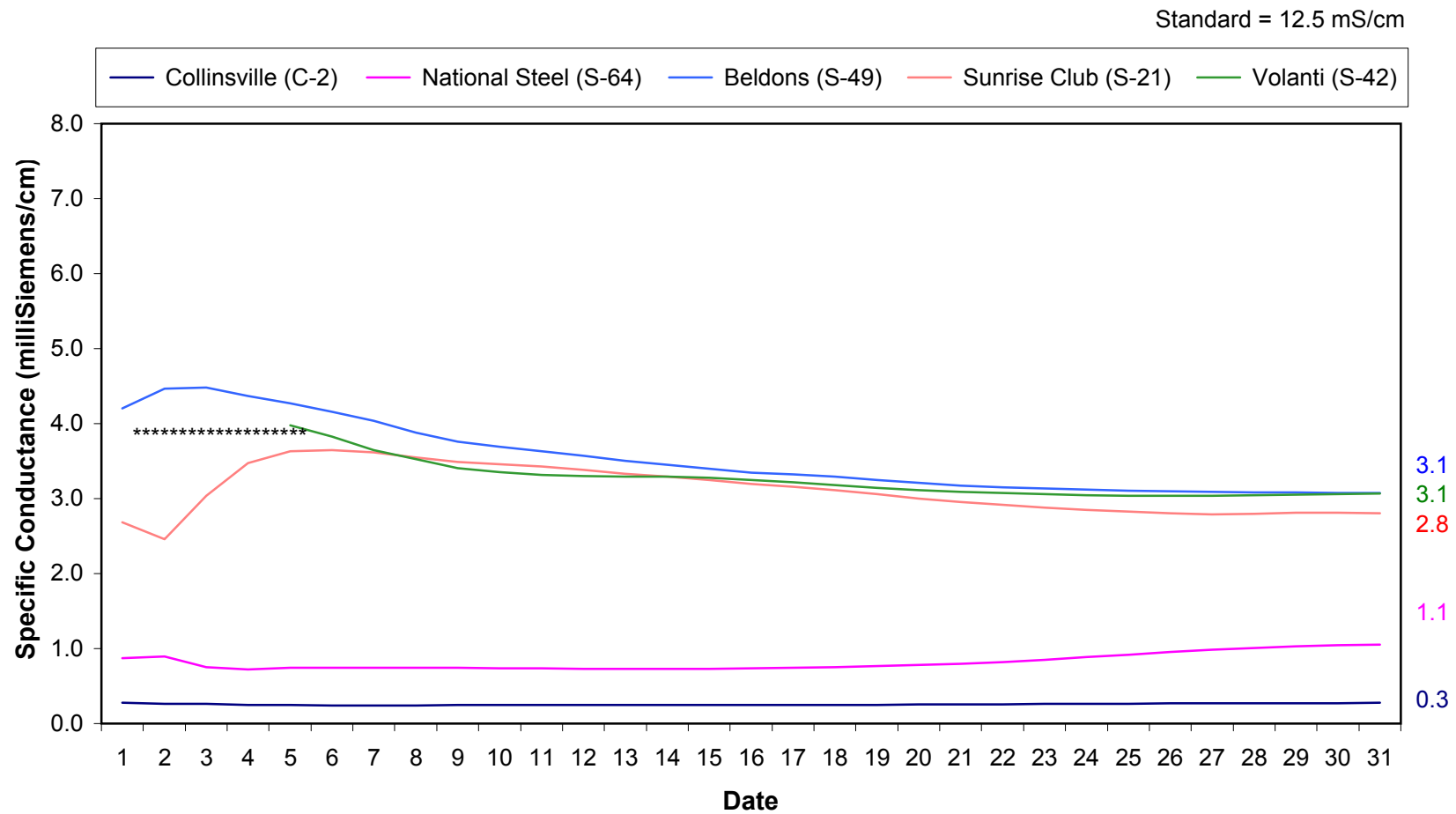
Station	Specific Conductance (mS/cm)*	Standard	Standard meet?
C-2**	0.3	12.5	Yes
S-64	1.1	12.5	Yes
S-49	3.1	12.5	Yes
S-42	3.1***	12.5	Yes
S-21	2.8	12.5	Yes

*milliSiemens per centimeter

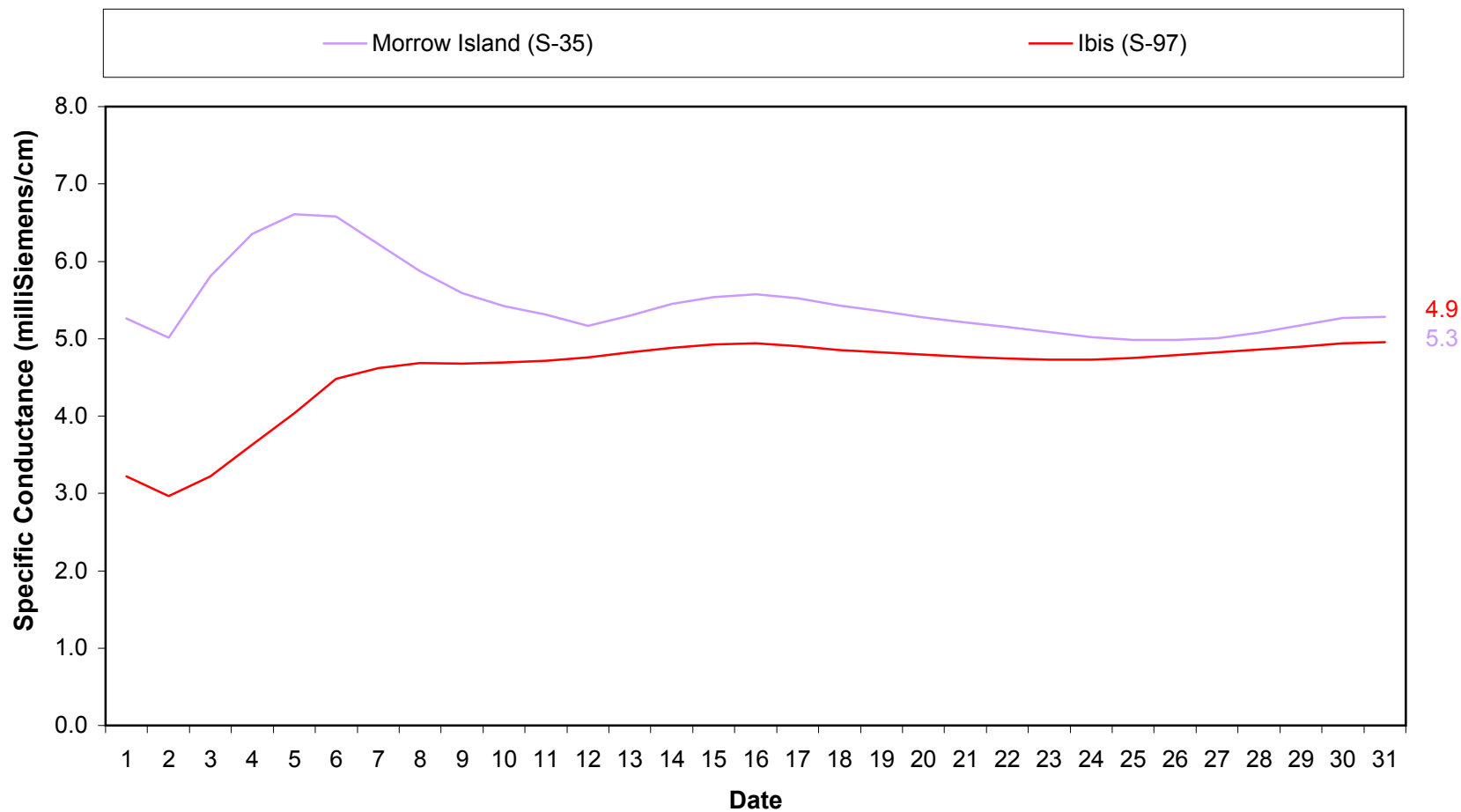
**The representative data from nearby USBR station is used in lieu of data from station C-2.

***Value does not reflect actual end of month PDM due to equipment problems. However, the number of missing data during the month was low enough that it did not alter the end of month result.

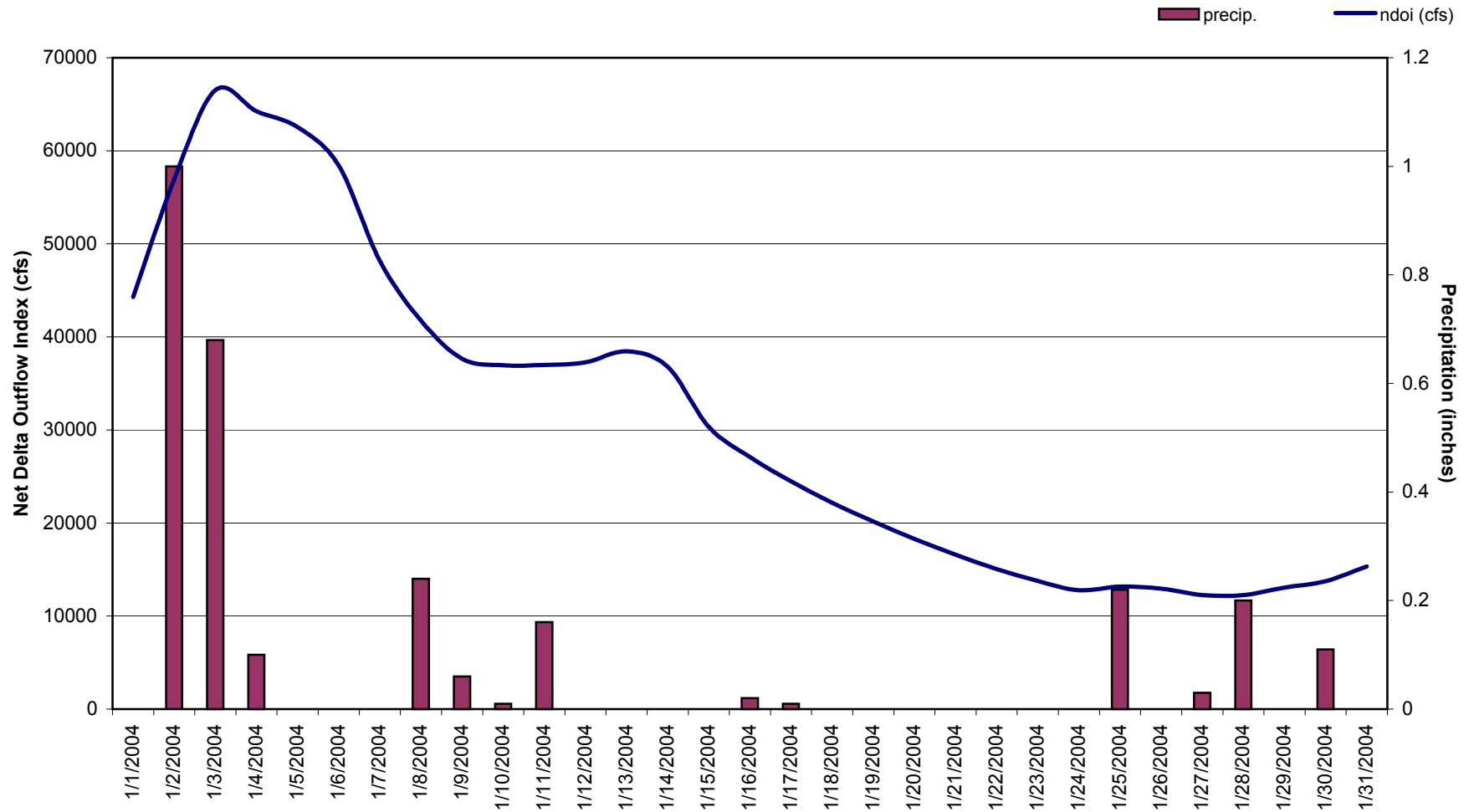
**Figure 1. Suisun Marsh Progressive Mean High Tide Specific Conductance
January 2004**



**Figure 2. Suisun Marsh Progressive Mean High Tide Specific Conductance
January 2004**

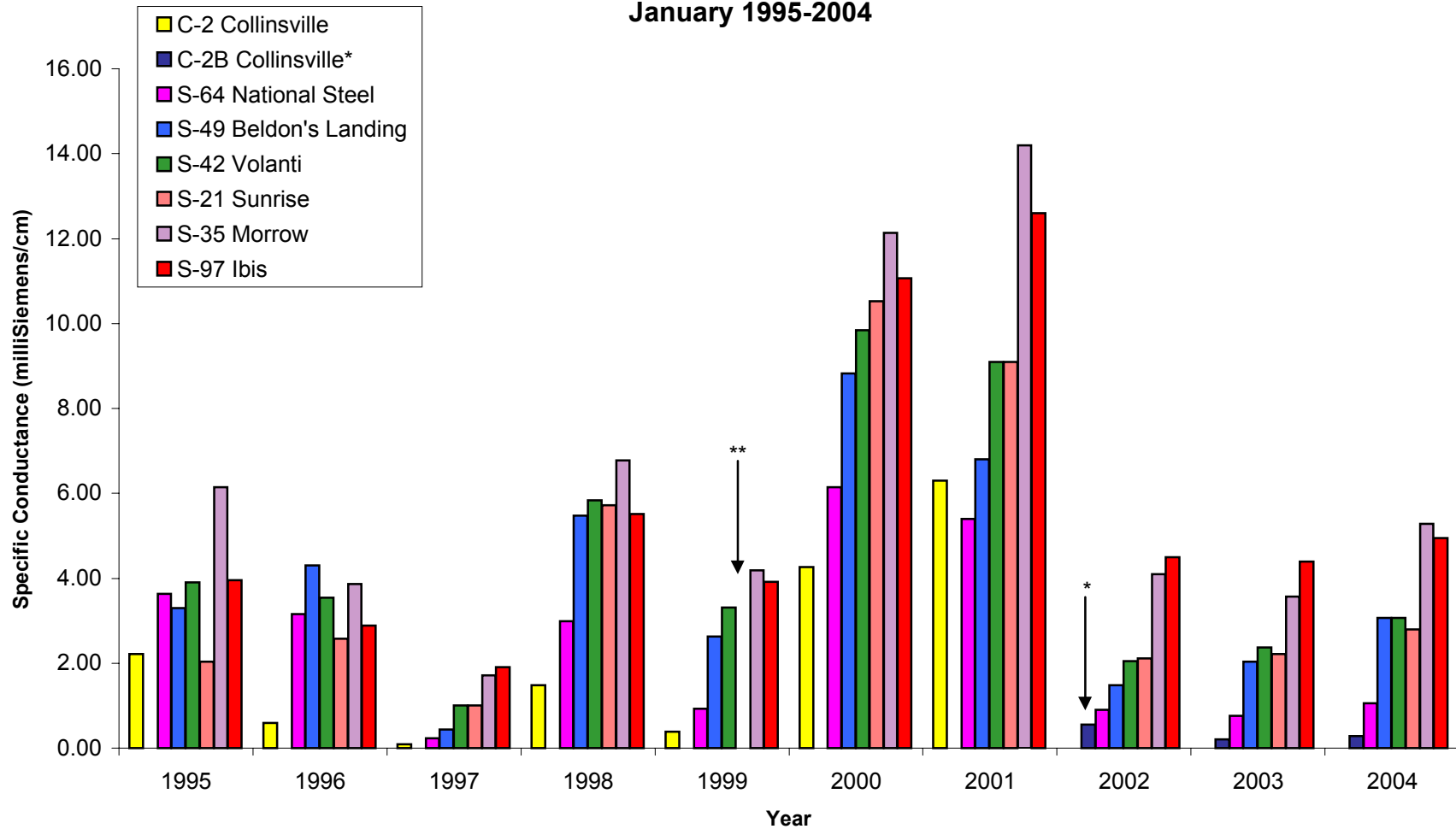


**Figure 3. Daily Net Delta Outflow Index and Precipitation*
January 2004**



*Preliminary DWR, O&M Delta Outflow data and precipitation from Fairfield Water Treatment Plant.

**Figure 4. Monthly Mean Specific Conductance at High Tide:
Comparison of Monthly Values for Selected Stations
January 1995-2004**



* = beginning in 2002.

** Data was not obtained due to equipment problem.

